ENVIRON

July 16, 2003

National Remedy Review Board
U.S. Environmental Protection Agency
Washington, D.C. 20460

Re: Hamilton Industrial Park Superfund Site,
South Plainfield, New Jersey

Dear Members of the Board:

The Hamilton Industrial Park PRP Group (the "PRP Group") appreciates this opportunity to provide comments on EPA's remedial alternatives, as identified to date, for the Second Operable Unit (OU-2) for the Hamilton Industrial Park Site (the "Site") in South Plainfield, New Jersey. For convenience of reference, we will divide our presentation into General Comments, Specific Comments and our Recommended Alternative Remedial Approach.

I. General Comments On EPA's Proposed Remedial Alternatives For OU-2

In its technical presentation to the public on June 9, 2003, EPA identified a series of potential remedial alternatives -- all estimated to cost in excess of $30 million -- to be considered as part of the Feasibility Study relating to OU-2. In reviewing the information presented by EPA, the PRP Group believes that EPA has overlooked the most cost-effective and appropriate remedial alternative for OU-2, and instead has focused upon a series of remedial alternatives which will be significantly more expensive, without offering materially greater protection to human health or the environment. Indeed, the PRP Group has analyzed EPA's cost estimates for its proposed remedial alternatives and has concluded, based upon a cost estimating system accepted by EPA and other governmental agencies, that those estimates are significantly understated.

Equally troubling to the PRP Group is EPA's failure to integrate into its analysis of possible OU-2 soil remedies the potential groundwater remedies which may be implemented at the Site. Such an approach poses the significant risk that EPA will select in both OU-2 and OU-3 inefficient and uncoordinated remedies to address both soil and groundwater issues. Finally, EPA's alternatives fail to recognize the Borough of South Plainfield's officially adopted (by unanimous vote of the Borough Council on July 15, 2002) Redevelopment Plan for the Site and surrounding properties, which includes complete renovation of the Site for retail, commercial/light industrial "flex" space and warehousing uses. This Redevelopment Plan cannot possibly be discounted as "speculative", given the fact that on July 19, 2003, the Borough Council formally designated a redeveloper, so that the desired redevelopment of the Site could be both expedited and fully integrated with the OU-2 remedy.

214 Carnegie Center • Princeton, NJ 08540-6284 • USA • Tel: (609) 452-9000 • Fax: (609) 452-0284 • www.environcorp.com

The remedial alternative which the PRP Group urges EPA to consider in the Feasibility Study involves excavation and capping, the extent of which is strategically defined to integrate fully with the redevelopment plans for the Site. Specifically, the PRP Group proposes the excavation of those areas of the Site having principal threat materials (as delineated through the methodology described in Section III below), including those areas where PCB-containing capacitors have been disposed and which coincidentally have the highest concentrations of VOCs in soil. The remaining areas of lower level contamination. (i.e, maximum PCB concentrations on the order of 1,000 mg/kg and a mean concentration of less than 100 mg/kg and total VOC concentrations on the order of 25 mg/kg and a mean concentration of less than 1 mg/kg) will be capped as part of the Site redevelopment by means of hardscape (paving and buildings) and vegetative soil cover buffer areas. This remedy will be far more cost-effective than any of the remedial alternatives identified by EPA on June 9, 2003. Moreover, it addresses areas meeting the definition of "principal threat" contamination and is protective of human health and the environment given the anticipated future use of the Site as specified under the adopted Redevelopment Plan and as proposed by the officially designated redeveloper. Finally, this remedy will have the added advantage of facilitating prompt redevelopment of the Site by relying upon proven environmental technologies, which do not need to be pilot tested to prove their efficacy.

Unfortunately, in the past, EPA has mistakenly selected unproven and expensive technologies at PCB sites, only to find that the technologies were ineffective and cost substantially more than originally projected. At several sites, like the Norwood PCB Site in Norwood, Massachusetts and the Raymark Site in Stratford, Connecticut, EPA has avoided those pitfalls by turning to capping as an effective and proven method for protecting human health and the environment[1]. Other examples of increased costs from the FS stage to actual implementation can be illustrated from the actual remediation costs presented in EPA's *Remediation Technology Cost Compendium* (EPA 2000) in comparison with the original costs projected in the RODs. For example, at the Re-Solve, Inc. Site in North Dartmouth, Massachusetts, the estimated total cost (capital cost plus O&M) to implement thermal treatment for PCB-contaminated soils was approximately $17 million as compared to the actual implementation cost of approximately $24 million. If EPA goes forward with the remedial alternatives identified for this Site and ignores the lessons learned from these other sites, we believe that EPA will be repeating the mistakes of the past. Therefore, we urge EPA to include targeted excavation to be followed by capping by means of explicit incorporation of the Site redevelopment components as one of the remedial alternatives to be included in the Feasibility Study.

To pursue only the remedial alternatives identified on June 9, 2003 would commit EPA to a strategic approach for this Site that is inconsistent with the Superfund Redevelopment Initiative in which EPA is to be "an active partner in returning sites to productive uses." To date, EPA has taken a passive approach in which they have been unwilling directly to incorporate the community's redevelopment planning into the remedy analysis. This passive approach fails to

---

[1] The 1989 Record of Decision ("ROD") for the Norwood site originally selected soil/sediment solvent extraction at a cost of $13.3 million (1989 dollars). EPA's contractor's proposal (at a cost of $54.8 million) for this work greatly exceeded the ROD cost estimate. As a result, EPA re-evaluated the site risks and proposed future site use, and determined that soil consolidation and capping would be equally protective and allow for commercial reuse of the site.

build on the lessons learned from the Agency's experience at other Superfund sites that are being successfully returned to productive use, including the Raymark Site in Stratford, Connecticut and the Industri-Plex Site in Woburn, Massachusetts.

II. Specific Comments On EPA's Proposed Remedial Alternatives For OU-2

A. EPA's cost estimates are significantly understated.

Using the scope of work defined by EPA for each remedial alternative (e.g., volume to be remediated) and a cost modeling system accepted by EPA, Army Corps of Engineers, DOD and DOE for estimating environmental costs (RACER 2000, developed by Talisman Partners of Engelwood, Colorado), it is clear that EPA has significantly underestimated the costs to be incurred in implementing each of Alternatives S-2 through S-5, with a possible 23% to 54% under-estimation of costs. A summary of the cost estimates for Alternatives S-2 through S-6 calculated using the RACER 2000 system is provided in Attachment A.

As indicated by a comparison of the cost estimates presented in Attachment A with the cost estimates developed by EPA for the Site (see the Cost Comparison Table provided in Attachment A), the major source of the difference in the costs is the unit price assumptions. The unit costs utilized in the RACER 2000 system have been compiled based on actual field experience, technology vendor input and standard industry cost databases. In addition, the system has been updated and validated annually. By comparison, EPA's cost estimates do not reference the source of the unit cost information presented.

In addition, the cost estimates presented by EPA for the Site are incomplete and potentially underestimate the level of effort required to implement the proposed treatment technologies at this Site for the following reasons:

- **Timeframe to complete remediation:** EPA has assumed that in situ solidification can be completed in 6 months. The actual time to conduct successfully in-situ solidification is likely to be significantly longer (based on the RACER 2000 estimates, the time to implement solidification technologies could range from 2 to 5 years), which would translate into significant increases in remediation costs.

- **Use of technologies that may not be applicable given Site conditions:** EPA has identified technologies, including solidification and low temperature thermal desorption, that have not been tested under the specific conditions found at the Site, and which may well not prove feasible given these the known site conditions. Notwithstanding this fact, EPA's cost estimates do not take into account the cost of on-site pilot scale testing of the solidification technology. Contaminants typically targeted for remediation by solidification/stabilization techniques (S/S) are inorganic compounds, and this technology has reportedly only limited applicability to PCBs. In any event, the application of S/S to sites with both inorganic contaminants and organic contaminants will require significant testing prior to selection of an appropriate "mix design". Therefore, site-specific pilot scale treatability tests (which EPA has not conducted at the Site) would have to be carried out to evaluate the applicability of S/S to this Site. The need for such testing may well lead to significant delays in full-scale implementation, and depending on the final design, could cost more to implement than estimated by EPA.

Moreover, there are additional site-specific limitations affecting the application of in-situ S/S to contaminated soils at the Site. Specifically, reagent delivery and effective mixing may be difficult in an in-situ application as a result of the overburden fill materials identified during the Remedial Investigation. These fill materials include man-made fill (gravel, cinder, ash, slag), and debris (brick, glass fragments, wood, metal fragments, capacitors). Debris such as drums, metal scrap and wood pieces may all interfere with the solidification process. Therefore, in-situ S/S may be ineffective as a treatment option given the heterogeneous physical characteristics at the Site. To address these heterogeneous fill materials, ex situ S/S treatment could be implemented following excavation and debris segregation. However, EPA has not included the cost for addressing the debris material present (other than that found in the capacitor disposal area) in the overburden soils being targeted for in-situ treatment. Therefore, the actual cost for the in-situ solidification remedy alternative is likely to be significantly higher than that estimated by EPA.

Similarly, debris segregation (in addition to removing the debris present in the capacitor disposal area) would also likely be required for the ex-situ thermal desorption alternative. EPA did not include costs for such more comprehensive debris segregation and management for the low temperature thermal desorption alternative. Therefore, the actual cost for this alternative is likely to be significantly higher than that estimated by EPA.

- **Underestimated residuals management:** Some S/S processes may result in significant increases in volume – sometimes up to twice the original volume. This increased volume of material would need to be addressed in the overall Site remediation costs, either in terms of additional cap construction costs (i.e., EPA's cost for capping the Site after S/S remediation is the same as the capping costs estimated under the other remedial alternatives [excluding Alternative S-2]) or in costs associated with the removal of excess material from the Site for disposal. Management of the increased volume of material associated with in situ solidification is not accounted for in EPA's costs. (Note: nor does EPA consider the impact of such excess material on the potential for Site redevelopment should it be disposed of on the Site.) Therefore, the actual cost for this alternative is likely to be significantly higher than estimated by EPA.

B. The remedy should account for proposed future redevelopment of the Site.
As noted under our General Comments, on July 15, 2003, the South Plainfield Borough Council unanimously adopted the Redevelopment Plan for the Site and surrounding parcels. A copy of the conceptual reuse plan underlying the Redevelopment Plan is provided as Attachment B. The redeveloper designated by the Borough is planning to

implement a redevelopment which is consistent with the approved Redevelopment Plan. However, it appears that EPA's proposed remedial alternatives for OU-2 have not been developed by integrating the Site reuse plans with the proposed remedies.

EPA fails to consider integrated remediation/redevelopment designed to reduce the overall cost of returning the Site to viable use, while, at the same time, fostering prompt and cost-effective redevelopment. For example, EPA's proposed alternatives do not reflect:

- the use of redevelopment hardscaping (e.g. access drives, parking areas and buildings) as an integral part of the remedy, which would eliminate the need for a multi-layer cap;
- the use of building demolition debris as backfill which would reduce or eliminate the need for clean fill to be brought to the Site to be used as backfill. (Note: effectively using such demolition debris as backfill also meaningfully reduces truck traffic impacts on already busy local streets);
- the need for stormwater detention ponds which could reduce the need for backfill material; or
- the option to leave existing slabs in place as a cover which would also serve to eliminate the need for a multi-layer cap.

Certain of EPA's proposed alternatives may entirely preclude Site redevelopment. For example, Alternative S-5, solidification/multi-layer cap, substantially increases the cost of redevelopment, since re-grading the Site for construction purposes would involve cutting through and destroying the integrity of the solidified/stabilized soil mass, resulting in the potential need to retreat or remove the material for off-site disposal. Further, the requirement of a complex multi-layer cap in Alternatives S-3 through S-6 will render redevelopment far more difficult and will negatively impact its economic viability (e.g., due to EPA's significant predicted O&M costs).

EPA also fails to consider future site use in its evaluation for the Alternative S-3: "Principal Threat" Excavation. EPA's Principal Threat Analysis should be conducted in the context of the future site redevelopment. As accepted by USEPA (and NJDEP) for the former Hyatt Clark Industries, Inc. Site in Clark, New Jersey, the principal threat assessment should be based on potential risks under likely future conditions following site redevelopment rather than hypothetical risks under generic land use conditions. Given the specific redevelopment plans for this Site (i.e., largely covered by pavement and buildings for retail, commercial/light industrial "flex" space and warehousing), the potential risks to persons who may be exposed to soils underlying the pavement and buildings, such as utility maintenance workers, should serve as the basis for the principal threat analysis rather than a "routine worker" who is unlikely to come in contact with soils under the pavement or buildings during daily activities.

C. **Evaluation of impacts to ground water is overstated in the remedy analysis.** EPA has inadequately evaluated the concentrations in soils that have the potential to impact ground water. EPA has relied on the NJDEP criteria for non-PCB contaminants of concern (i.e., NJDEP IGWSCC) to define soil to be remediated in order to mitigate potential impacts to ground water. NJDEP's IGWSCC have not been promulgated and, as such, are not applicable or relevant and appropriate requirements ("ARARs"). Rather, NJDEP has published these criteria merely as guidance levels for its site remediation program. Further, several assumptions underlying NJDEP IGWSCC that have been used by the EPA in delineating the extent of contaminated soils in OU-2 are unduly conservative. For example,

- NJDEP's criteria are reportedly based on generic assumptions that a 100% of precipitation infiltrates the soil, and that the depth to ground water is 10 feet are clearly unrealistic and need to be evaluated on a case-by-case basis. In point of fact, during the on-site drilling by the PRP Group of monitoring wells at the Site, groundwater was not encountered until depths of 50 feet to 55 feet below the ground surface and was observed to be under confined conditions. Potential impacts to ground water from constituents present in site soils should be evaluated based on such Site-specific information, including actual depth to the aquifer and net infiltration.

- NJDEP's criteria are based on the generic assumption that contaminants do not degrade, even though the degradation process can be substantial for numerous chemicals (e.g., VOCs) over the assumed 70-year period.

III. Recommended Alternative Remedial Approach For OU-2

Although EPA's proposed alternatives are extraordinarily expensive and technically flawed, there is a remedial alternative which EPA has failed to identify that involves proven technologies; will be far less costly; will be protective of human health and the environment; will comport with EPA's guidance on properly addressing principal threat material; and will be fully integrated with the planned redevelopment of the Site. This omitted remedial alternative for addressing potential risks associated with OU-2 soils involves the following elements.

- Excavation and off-site disposal of principal threat material, including the material within the capacitor/debris disposal area which represents the primary source of principal threat material (both PCBs and VOCs).

- Redevelopment capping for all other soils using the hardscape and soil (vegetative) cover to be installed as part of the Site redevelopment.

This remedial alternative has the following beneficial attributes:

- **Targeted excavation is far more consistent with EPA's guidance on principal threat materials than are the other remedial alternatives identified by EPA on June 9, 2003.** In fashioning those other remedial alternatives, EPA has failed to properly apply its guidance on principal threat materials. Properly applied, EPA's guidance dictates that the volumes of principal threat materials will be substantially less than projected by EPA and, hence, can be more efficiently handled through targeted excavation than through the currently identified remedial alternatives. EPA's definition of principal threat material is as follows: "Principal threat wastes are those source materials [including contaminated soil] considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner and/or would present a significant risk to human health or the environment should exposure occur" (USEPA, 1991). EPA has not established an absolute threshold level of risk for identifying principal threat materials. However, it considers as principal threat "those source materials with toxicity and mobility characteristics that combine to pose a potential risk *several orders of magnitude* greater than the risk level that is acceptable for the current or reasonably anticipated future land use, given realistic exposure scenarios" (USEPA 1997, emphasis added). In Superfund, acceptable risk levels are cumulative excess cancer risk to an individual based on reasonable maximum exposure for both current and reasonably expected future land use of 10^{-4} or less, and a non-cancer hazard index (HI) of 1 or less (USEPA 1991). Therefore, contaminated soil that poses a cumulative excess cancer risk higher than 10^{-2} or represents a HI higher than 100 (i.e., at least two orders of magnitude higher than the acceptable levels) might be reasonably viewed as a principal threat material for which treatment should be considered. Conversely, contaminated soil that poses cumulative excess cancer risk lower than 10^{-2} or represents a HI lower than 100 may be considered as low-level threat material for which containment would be appropriate.

- EPA is relying on outdated and inappropriate PCB criteria for estimating contaminated soil volumes. EPA's definition of principal threat material as soils containing PCB concentrations greater than 500 mg/kg is based on outdated information presented in the 1990 *Guidance on Remedial Actions for Superfund Sites with PCB Contamination.* As summarized in Attachment C, the assumptions used by EPA in developing the criteria suggested in the 1990 guidance, including the toxicity data for PCBs, have been updated since 1990. Use of updated toxicity data and exposure assumptions would increase the concentration defined as principal threat.

- EPA estimated soil volumes should be based on current site-specific risk assessment approaches, including the assessment of total risk over an exposure area, not just risk associated with a single constituent at a single sampling point. Use of a site-specific risk-based approach for defining "principal threat" material as soils in an exposure area exhibiting an exposure concentration in excess of *several orders of magnitude* greater than the acceptable risk level would likely result in lower estimates of soil to be remediated, while still protecting human health and the environment.

- **There are no significant residual risks of exposure associated with the contained soils.** As a practical matter, the only threat of potential exposure remaining after the targeted excavation of the Site and capping by the hardscaping and soil cover will be contact with the in-place material during some future maintenance activities that involved excavation. Under this scenario, the workers can be protected from direct contact with the contaminated soils. However, in the event such precautions were not followed, contact would be short term in nature, and at a target cancer risk level of 10^{-2} and target HI of 100, "principal threat" levels under this type of exposure would correspond to a concentration on the order of 10,000 mg/kg or 10 times higher than the maximum concentration proposed to be left in-place.

- **Targeted excavation addresses the primary principal threat material acting as a potential source to ground water contamination.** The VOCs in soil, the highest concentrations of which are primarily co-located with the capacitor disposal/debris[2] area, will be largely eliminated by the excavation of these materials. The redevelopment cover (asphalt, building slabs, vegetative soil cover) will contain the lower threat material remaining on-site after the excavation of the capacitor disposal/debris area. Any residual impacts to groundwater by the contained materials remaining on-site will be insignificant.

- **Following targeted excavation, Site redevelopment will adequately address the primary risk pathways of concern.** According to EPA's baseline human health risk assessment, the majority of the cancer risks and non-cancer HIs under the future use scenario are associated with exposure to non-VOCs in soil via incidental ingestion, dermal contact and/or particulate inhalation. The exception to this is for the future indoor worker in the currently undeveloped portion of the Site. As indicated above, soils having elevated VOCs will largely be removed as they are co-located with the capacitor disposal/debris area. The risks associated with the soils left in-place can be adequately mitigated via pathway elimination – i.e., the construction of large areas of hardscape (pavement and buildings) as part of the Site redevelopment will eliminate routine exposures to contaminants in site soils, regardless of concentration.

- **Removal of even principal threat material is not required in all cases.** EPA's *Guidance on Remedial Actions for Superfund Sites with PCB Contamination* recognizes that in some cases it may be appropriate to contain principal threats as well as low-threat material, because there are large volumes of contaminated material or the PCBs are mixed with other contaminants that makes treatment impracticable. Such material that is not treated should be contained to prevent access that would result in exposures exceeding protective levels. Indeed, in the case of the Raymark Site with 21,000 cy of on-site principal threat wastes, EPA determined that the risks and costs associated with treatment of the substantial volumes of contaminated soil waste materials on-site outweighed the limited increase in protectiveness afforded. Therefore, treatment was not found to be practical, and a capping remedy was selected for the Raymark Site.

In sum, the PRP Group urges EPA to include the targeted excavation and redevelopment capping defined in this letter. Failure to do so will likely result in the selection of a remedial action for OU-2 which is inconsistent with CERCLA, the National Contingency Plan and EPA's own guidance; and which will be speculative as to its success, prohibitively expensive, and inconsistent with the Borough of South Plainfield's desire to expeditiously implement its Redevelopment Plan for the Site.

---

[2] This area includes the capacitor disposal area identified by EPA, as well as those additional area(s) where principal threat contaminated debris have been disposed of.

Should you have any questions regarding this letter, please do not hesitate to contact us.

Sincerely,
On behalf of the Hamilton Industrial Park Group

for J. Mark Nielsen, P.E.
Manager

jmn:02-5840f4\\RRB Comments(7-16-03).doc

Enclosure

cc: R. Sanoff, Esq., Foley Hoag (617-832-1152)
K. Stollar, Esq., Foley Hoag (617-832-1218)
M. Last, Esq., Rackemann, Sawyer & Brewster (617-951-1192)
M. Scott, ENVIRON

ATTACHMENT A
COST ESTIMATION USING RACER 2000

RACER 2000™ (RACER) is an off-the-shelf PC-based computer software program that incorporates the general information from R.S. Means Company cost data books with elements of an expert system. RACER allows the parameterization of environmental data to generate direct costs based on the remedial technologies selected. Available technologies include an extremely wide array of conventional and innovative remedial technologies for soil and ground water remediation, including in situ and ex situ thermal, chemical, and biologic remedial as well as containment technologies. The available models in RACER can account for all elements of a treatment process train, including multiphase extraction, treatment, and disposal. In addition, numerous models are available to estimate costs for other elements of the remedial process including investigations, studies, remedial design, sampling and analysis, excavation, restoration, site work, utilities, and transportation.

Direct Costs

RACER estimates direct costs for remedial actions by requiring certain data sets that vary with the nature of the selected technologies. For example, ex situ thermal treatment (e.g., low temperature thermal desorption) requires an estimation of the volume of soil to be treated and its moisture content. In addition, secondary parameters, such as bulk density, particle size, etc., can be modified, or the RACER default values used. Capital direct costs include the purchase, mobilization, installation, and initial operation of the technology. RACER also estimates the costs for operations and maintenance (O&M). O&M costs include operator labor, routine maintenance, utility costs, and replacement parts. The standard RACER default assumptions can be used or modified. In addition, the overall qualitative level of effort (low, moderate, complex, highly complex) can be factored into the cost estimate.

Indirect Costs

RACER also calculates the indirect costs of remedial action as well as the direct costs. Indirect costs include general and administrative charges that are not attributable to any specific remedial element (e.g., a project trailer), overhead/fringe costs for labor, contractor profit, pollution insurance, and bonds (if required). These costs can be modified from the RACER defaults, and can be allocated between prime and subcontractors.

RACER also accounts for local variations in sales taxes and electricity, labor, material, and equipment costs, based on the project locations.

Comparison of costs presented by the EPA with cost estimates obtained using RACER 2000

	USEPA	RACER	% Diff
Alternative S-2	$ 130,796,749	$ 170,907,027	23%
Alternative S-3	$ 104,185,527	$ 147,223,664	29%
Alternative S-4	$ 37,749,146	$ 56,732,028	33%
Alternative S-5a	$ 38,755,054	$ 84,113,266	54%
Alternative S-5b	$ 38,755,054	$ 71,342,625	46%
Alternative S-6	$ 79,570,491	$ 66,295,949	-20%

Alternative S-2: Excavation/Off-site Disposal

Cost Item	Estimated Quantity	Units	Unit Cost	Extended Cost
Clearing and Grubbing	7	acre	$ 5,096.20	$ 35,673
Excavation and Clean Fill	300,000	cy	$ 19.06	$ 5,717,574
Landscape and Vegetation	20	acre	$ 1,427.46	$ 28,549
Off-site Disposal				
TSCA Waste	292,031	cy	$ 297.58	$ 86,902,824
Non-Hazardous Waste	80,000	cy	$ 83.48	$ 6,678,248
Capacitor Disposal Area				
Disposal	2,344	cy	$ 825.63	$ 1,935,275

Total Direct Costs	$ 101,298,143
Markups	$ 55,771,090
Total Construction Cost	***$ 157,069,233***
Nominal 30 Year O&M	$ -
Markups	$ -
Average Annual O&M with Markups	$ -
Present Worth 30-Year O&M (1% Discount Rate)	***$ -***
Escalation to 2004 dollars	$ 13,837,794
Total Present Worth	**$ 170,907,027**

Notes:
- Total Present Worth Cost is in Year 2004 dollars.
- Unit costs are derived from the extended cost developed by RACER 2000™.
- Markups include General Conditions, Overhead, Prime Profit, Contingency, and Owner Costs.
- Markups do not include engineering design and oversight costs.
- Construction costs based on a start of January 2004.
- O&M costs based on a start of January 2005.
- Escalation accounts for the difference in Year 2000 costs (which the RACER data base contains) and Year 2004 costs.
- Per EPA's assumption, disposal volume for excavated soils includes 25% fluff.
- Assumes that 75% of the debris in the capacitor disposal area would be disposed of in a TSCA-permitted landfill, and 25% would be incinerated.
- All other quantities as estimated by EPA.

Alternative S-3: "Principal Threat" Excavation

Cost Item	Estimated Quantity	Units	Unit Cost	Extended Cost
Clearing and Grubbing	8.4	acre	$ 5,096.19	$ 42,808
Excavation and Clean Fill	152,000	cy	$ 19.26	$ 2,928,236
Off-site Disposal				
TSCA Waste	188,656	cy	$ 297.63	$ 56,150,394
Capacitor Disposal Area				
Disposal	2,344	cy	$ 825.63	$ 1,935,275
Multi-layer Cap				
Top Soil (6")	20,850	cy	$ 25.76	$ 537,135
Clean Fill (18")	64,400	cy	$ 8.29	$ 533,830
Compaction (24")	93,400	sf	$ 20.08	$ 1,875,828
Geotextile (2 layer)	1,982,000	sf	$ 0.38	$ 748,446
HDPE Liner	991,000	sf	$ 1.62	$ 1,605,964
Liner Anchor Trench	4,040	lf	$ 0.92	$ 3,710
Vegetation	20	acre	$ 13,427.76	$ 268,555

Total Direct Costs	$ 66,630,182
Markups	$ 37,322,025
Total Construction Cost	***$ 103,952,207***
Nominal 30 Year O&M	$ 14,652,423
Markups	$ 10,066,076
Average Annual O&M with Markups	$ 823,950
Present Worth 30-Year O&M (1% Discount Rate)	***$ 21,053,723***
Escalation to 2004 dollars	$ 22,217,734
Total Present Worth	**$ 147,223,664**

Notes:
- Total Present Worth Cost is in Year 2004 dollars.
- Unit costs are derived from the extended cost developed by RACER 2000™.
- Markups include General Conditions, Overhead, Prime Profit, Contingency, and Owner Costs.
- Markups do not include engineering design and oversight costs.
- Construction costs based on a start of January 2004.
- O&M costs based on a start of January 2005.
- Escalation accounts for the difference in Year 2000 costs (which the RACER data base contains) and Year 2004 costs.
- Per EPA's assumption, disposal volume for excavated soils includes 25% fluff.
- Assumes that 75% of the debris in the capacitor disposal area would be disposed of in a TSCA-permitted landfill, and 25% would be incinerated.
- Quantities for the multi-layer cap estimated by RACER for a 20 acre area.
- All other quantities as estimated by EPA.

Alternative S-4: Soil Vapor Extraction/Multi-layer Cap

Cost Item	Estimated Quantity	Units	Unit Cost	Extended Cost
Clearing and Grubbing	8.4	acre	$ 5,096.19	$ 42,808
Multi-layer Cap				
Top Soil (6")	20,850	cy	$ 25.76	$ 537,135
Clean Fill (18")	64,400	cy	$ 8.29	$ 533,830
Compaction (24")	93,400	sf	$ 20.08	$ 1,875,828
Geotextile (2 layer)	1,982,000	sf	$ 0.38	$ 748,446
HDPE Liner	991,000	sf	$ 1.62	$ 1,605,964
Liner Anchor Trench	4,040	lf	$ 0.92	$ 3,710
Vegetation	20	acre	$ 13,427.76	$ 268,555
Capacitor Disposal Area				
Excavation and Clean Fill	7,500	cy	$ 21.65	$ 162,360
Incineration/Disposal	2,344	cy	$ 825.63	$ 1,935,275
TSCA Waste	7,031	cy	$ 297.59	$ 2,092,353
SVE				
Equipment Cost & Installation	1	ea	$ 793,878.89	$ 793,879
Carbon Adsorption Units	1	ea	$ 60,852.13	$ 60,852
Operational Labor	24	mo	$ 2,597.86	$ 62,349
Carbon Management	24	mo	$ 1,121.88	$ 26,925
Power	24	mo	$ 1,890.76	$ 45,378

Total Direct Costs	$ 10,795,647
Markups	$ 8,342,226
Total Construction Cost	***$ 19,137,873***
Nominal 30 Year O&M	$ 14,652,424
Markups	$ 10,066,076
Average Annual O&M with Markups	$ 823,950
Present Worth 30-Year O&M (1% Discount Rate)	***$ 21,053,724***
Escalation to 2004 dollars	$ 16,540,431
Total Present Worth	**$ 56,732,028**

Notes:
- Total Present Worth Cost is in Year 2004 dollars.
- Unit costs are derived from the extended cost developed by RACER 2000™.
- Markups include General Conditions, Overhead, Prime Profit, Contingency, and Owner Costs.
- Markups do not include engineering design and oversight costs.
- Construction costs based on a start of January 2004.
- O&M costs based on a start of January 2005.
- Escalation accounts for the difference in Year 2000 costs (which the RACER data base contains) and Year 2004 costs.
- Per EPA's assumption, disposal volume for excavated soils includes 25% fluff.
- Assumes that 75% of the debris in the capacitor disposal area would be disposed of in a TSCA-permitted landfill, and 25% would be incinerated.
- Quantities for the multi-layer cap estimated by RACER for a 20 acre area.
- Quantities for the SVE system estimated by RACER.
- All other quantities as estimated by EPA.

Alternative S-5a: In-situ Solidification/Multi-layer Cap

Cost Item	Estimated Quantity	Units	Unit Cost		Extended Cost
Clearing and Grubbing	8.4	acre	$	5,096.19	$ 42,808
Multi-layer Cap					
Top Soil (6")	20,850	cy	$	25.76	$ 537,135
Clean Fill (18")	64,400	cy	$	8.29	$ 533,830
Compaction (24")	93,400	sf	$	20.08	$ 1,875,828
Geotextile (2 layer)	1,982,000	sf	$	0.38	$ 748,446
HDPE Liner	991,000	sf	$	1.62	$ 1,605,964
Liner Anchor Trench	4,040	lf	$	0.92	$ 3,710
Vegetation	20	acre	$	13,427.76	$ 268,555
Capacitor Disposal Area					
Excavation and Clean Fill	7,500	cy	$	21.65	$ 162,360
Incineration/Disposal	2,344	cy	$	825.63	$ 1,935,275
TSCA Waste	7,031	cy	$	297.59	$ 2,092,353
In-situ Solidification					
Portland Cement	30,660	ton	$	72.28	$ 2,216,243
Urrichem Proprietary Additive	2,044	ton	$	984.56	$ 2,012,432
Equipment Cost & Installation	55	mo	$	118,589.55	$ 6,522,425
Operational Labor	55	mo	$	126,429.17	$ 6,953,605
Power & Fuel	55	mo	$	2,877.87	$ 158,283

Total Direct Costs	$	27,669,251
Markups	$	18,281,593
Total Construction Cost	***$***	***45,950,844***
Nominal 30 Year O&M	$	14,652,424
Markups	$	10,066,076
Average Annual O&M with Markups	$	823,950
Present Worth 30-Year O&M (1% Discount Rate)	***$***	***21,053,724***
Escalation to 2004 dollars	$	17,108,698
Total Present Worth	**$**	**84,113,266**

Notes:
- Total Present Worth Cost is in Year 2004 dollars.
- Unit costs are derived from the extended cost developed by RACER 2000™.
- Markups include General Conditions, Overhead, Prime Profit, Contingency, and Owner Costs.
- Markups do not include engineering design and oversight costs.
- Construction costs based on a start of January 2004.
- O&M costs based on a start of January 2005.
- Escalation accounts for the difference in Year 2000 costs (which the RACER data base contains) and Year 2004 costs.
- Per EPA's assumption, disposal volume for excavated soils includes 25% fluff.
- Assumes that 75% of the debris in the capacitor disposal area would be disposed of in a TSCA-permitted landfill, and 25% would be incinerated.
- Quantities for the multi-layer cap estimated by RACER for a 20 acre area.
- Quantities for the in situ solidifcation process estimated by RACER.
- All other quantities as estimated by EPA.

Alternative S-5b: Ex-situ Solidification/Multi-layer Cap

Cost Item	Estimated Quantity	Units	Unit Cost	Extended Cost
Clearing and Grubbing	8.4	acre	$ 5,096.19	$ 42,808
Multi-layer Cap				
Top Soil (6")	20,850	cy	$ 25.76	$ 537,135
Clean Fill (18")	64,400	cy	$ 8.29	$ 533,830
Compaction (24")	93,400	sf	$ 20.08	$ 1,875,828
Geotextile (2 layer)	1,982,000	sf	$ 0.38	$ 748,446
HDPE Liner	991,000	sf	$ 1.62	$ 1,605,964
Liner Anchor Trench	4,040	lf	$ 0.92	$ 3,710
Vegetation	20	acre	$ 13,427.76	$ 268,555
Capacitor Disposal Area				
Excavation and Clean Fill	7,500	cy	$ 21.65	$ 162,360
Incineration/Disposal	2,344	cy	$ 825.63	$ 1,935,275
TSCA Waste	7,031	cy	$ 297.59	$ 2,092,353
Ex-situ Solidification				
Excavation	152,000	cy	$ 19.26	$ 2,928,236
Portland Cement	30,780	ton	$ 72.28	$ 2,224,917
Urrichem Proprietary Additive	2,052	ton	$ 984.56	$ 2,020,308
Equipment Cost & Installation	20	mo	$ 205,936.35	$ 4,118,727
Operational Labor	20	mo	$ 13,799.50	$ 275,990
Fuel	20	mo	$ 639.79	$ 12,796

Total Direct Costs	$ 21,387,238
Markups	$ 12,826,963
Total Construction Cost	***$ 34,214,201***
Nominal 30 Year O&M	$ 14,652,424
Markups	$ 10,066,076
Average Annual O&M with Markups	$ 823,950
Present Worth 30-Year O&M (1% Discount Rate)	***$ 21,053,724***
Escalation to 2004 dollars	$ 16,074,700
Total Present Worth	**$ 71,342,625**

Notes:
- Total Present Worth Cost is in Year 2004 dollars.
- Unit costs are derived from the extended cost developed by RACER 2000™.
- Markups include General Conditions, Overhead, Prime Profit, Contingency, and Owner Costs.
- Markups do not include engineering design and oversight costs.
- Construction costs based on a start of January 2004.
- O&M costs based on a start of January 2005.
- Escalation accounts for the difference in Year 2000 costs (which the RACER data base contains) and Year 2004 costs.
- Per EPA's assumption, disposal volume for excavated soils includes 25% fluff.
- Assumes that 75% of the debris in the capacitor disposal area would be disposed of in a TSCA-permitted landfill, and 25% would be incinerated.
- Quantities for the multi-layer cap estimated by RACER for a 20 acre area.
- Quantities for the ex situ solidifcation process estimated by RACER.
- All other quantities as estimated by EPA.

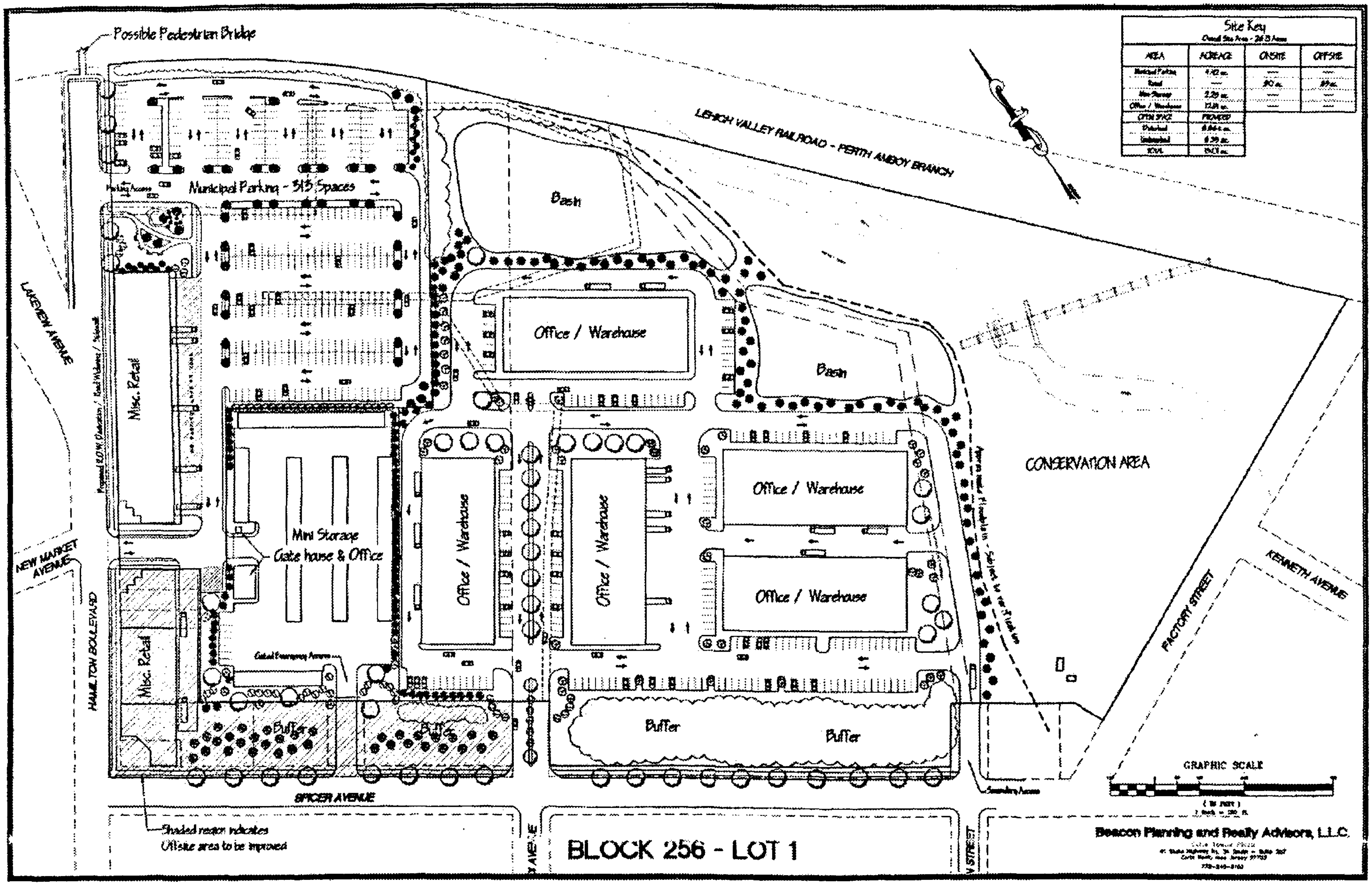
Alternative S-6: LTTD/Multi-layer Cap

Cost Item	Estimated Quantity	Units	Unit Cost		Extended Cost
Clearing and Grubbing	8.4	acre	$ 5,096.19	$	42,808
Multi-layer Cap					
Top Soil (6")	20,850	cy	$ 25.76	$	537,135
Clean Fill (18")	64,400	cy	$ 8.29	$	533,830
Compaction (24")	93,400	sf	$ 20.08	$	1,875,828
Geotextile (2 layer)	1,982,000	sf	$ 0.38	$	748,446
HDPE Liner	991,000	sf	$ 1.62	$	1,605,964
Liner Anchor Trench	4,040	lf	$ 0.92	$	3,710
Vegetation	20	acre	$ 13,427.76	$	268,555
Capacitor Disposal Area					
Excavation and Clean Fill	7,500	cy	$ 21.65	$	162,360
Incineration/Disposal	2,344	cy	$ 825.63	$	1,935,275
TSCA Waste	7,031	cy	$ 297.59	$	2,092,353
LTTD					
Excavation	152,000	cy	$ 19.26	$	2,928,236
Mobilization/Demobilization	1	ea	$ 485,337.51	$	485,338
Service Contract	272,428	ton	$ 19.41	$	5,288,975

Total Direct Costs	$	18,508,813
Markups	$	11,067,325
Total Construction Cost	***$***	***29,576,138***
Nominal 30 Year O&M	$	14,652,424
Markups	$	10,066,076
Average Annual O&M with Markups	$	823,950
Present Worth 30-Year O&M (1% Discount Rate)	***$***	***21,053,724***
Escalation to 2004 dollars	$	15,666,087
Total Present Worth	**$**	**66,295,949**

Notes:
- Total Present Worth Cost is in Year 2004 dollars.
- Unit costs are derived from the extended cost developed by RACER 2000™.
- Markups include General Conditions, Overhead, Prime Profit, Contingency, and Owner Costs.
- Markups do not include engineering design and oversight costs.
- Construction costs based on a start of January 2004.
- O&M costs based on a start of January 2005.
- Escalation accounts for the difference in Year 2000 costs (which the RACER data base contains) and Year 2004 costs.
- Per EPA's assumption, disposal volume for excavated soils includes 25% fluff.
- Assumes that 75% of the debris in the capacitor disposal area would be disposed of in a TSCA-permitted landfill, and 25% would be incinerated.
- Quantities for the multi-layer cap estimated by RACER for a 20 acre area.
- Quantities for the LTTD process estimated by RACER.
- All other quantities as estimated by EPA.

ATTACHMENT B
CONCEPTUAL REUSE PLAN FOR THE SITE


Possible Pedestrian Bridge
Site Key
AREA
ACREAGE
ONSITE
OFFSITE
LEHIGH VALLEY RAILROAD - PERTH AMBOY BRANCH
Municipal Parking - 313 Spaces
Basin
Office / Warehouse
Basin
LAKEVIEW AVENUE
Misc. Retail
Mini Storage
Gate house & Office
Office / Warehouse
Office / Warehouse
Office / Warehouse
Office / Warehouse
CONSERVATION AREA
NEW MARKET AVENUE
HAMILTON BOULEVARD
Misc. Retail
KENNETH AVENUE
FACTORY STREET
Buffer
Buffer
Buffer
Buffer
GRAPHIC SCALE
SPICER AVENUE
Shaded region indicates
Offsite area to be improved
BLOCK 256 - LOT 1
Beacon Planning and Realty Advisors, L.L.C.

400347

ATTACHMENT C
REVIEW OF ASSUMPTIONS FOR CALCULATING PCB SOIL CLEANUP LEVELS

Review of Assumptions for Calculating PCBs Soil Cleanup Level

Cancer Risk Calculations

	Units	EPA 1990 Guidance	Comment
Cancer slope factor (SF)	(mg/kg/day)$^{-1}$	7.7	The slope factor for PCBs was revised in EPA (1996a) to (2 mg/kg/day

Lifetime Average Daily Dose (LADD) Calculations

Soil Ingestion	Units	EPA 1990 Guidance	Comment
Soil ingestion rate for child	mg/day	200	These assumptions are consistent with EPA (1991).
Soil ingestion rate for adult	mg/day	100	These assumptions are consistent with EPA (1991).
Absorption fraction	unitless	0.3	An absorption fraction of 1 would be consistent with EPA (1996a).
Exposure frequency	days/year	365	A frequency of 350 days/yr would be consistent with EPA (1991).
Exposure duration for child	years	6	These assumptions are consistent with EPA (1991).
Exposure duration for adult	years	24	These assumptions are consistent with EPA (1991).
Body weight for child	kg	16	A body weight of 15 kg would be consistent with EPA (1991).
Body weight for adult	kg	70	These assumptions are consistent with EPA (1991).
Averaging time	days	25,550	These assumptions are consistent with EPA (1989).
Soil Dermal Contact	**Units**	**EPA 1990 Guidance**	**Comment**
Initial soil concentration	mg/kg	1	
Average soil concentration for child	mg/kg	0.38	EPA (1990) accounted for depletion of PCBs via volatilization.
Average soil concentration for adult	mg/kg	0.28	EPA (1990) accounted for depletion of PCBs via volatilization.
Soil adherence factor for child	mg-soil/cm^2	2.77	An adherence factor of 0.2 mg/cm^2 would be consistent with EPA (200
Soil adherence factor for adult	mg-soil/cm^2	2.77	An adherence factor of 0.07 mg/cm^2 would be consistent with EPA (20
Skin surface area for child	cm^2/day	4,000	A surface area of 2,800 cm^2 would be consistent with EPA (2001).
Skin surface area for adult	cm^2/day	3,100	A surface area of 5,700 cm^2 would be consistent with from EPA (2001)
Absorption fraction	unitless	0.1	An absorption fraction of 0.14 is recommended in EPA (2001).
Exposure frequency for child	days/year	132	A frequency of 350 days/yr would be consistent with EPA (1991).
Exposure frequency for adult	days/year	52	A frequency of 350 days/yr would be consistent with EPA (1991).
Exposure duration for child	years	15	A duration of 6 years would be consistent with EPA (1991).
Exposure duration for adult	years	12	A duration of 24 years would be consistent with EPA (1991).
Body weight for child	kg	38	A body weight of 15 kg would be consistent with EPA (1991).
Body weight for adult	kg	70	These assumptions are consistent with EPA (1991).
Averaging time	days	25,550	These assumptions are consistent with EPA (1989).
Soil Vapor Inhalation	**Units**	**EPA 1990 Guidance**	**Comment**
Inhalation rate for adult	m^3/day	30	A rate of 20 m3/day would be consistent with EPA (1991).
Absorption fraction	unitless	0.5	An absorption fraction of 1 is consistent with EPA (1996a).
Exposure frequency for adult	days/year	365	A frequency of 350 days/yr would be consistent with EPA (1991).
Exposure duration for adult	years	30	These assumptions are consistent with EPA (1991).
Body weight for adult	kg	70	These assumptions are consistent with EPA (1991).
Averaging time	days	25,550	These assumptions are consistent with EPA (1989).

References:

EPA. 1989. Risk Assessment Guidance for Superfund. Volume I, Human Health Evaluation Manual. Office of Emergency and Remedial Response. EPA/540-1-89-002. OSWER Directive 9285.7-01a. December.

EPA. 1990. Guidance on Remedial Actions for Superfund Sites with PCB Contamination. Office of Emergency and Remedial Response. OSWER Directive 9355.4-01. August.

EPA. 1991. Human health evaluation manual, supplemental guidance: "Standard default exposure factors." Memorandum from T. Fields, Jr., Office of Emergency Remedial Response, to B. Diamond, Office of Waste Programs Enforcement. OSWER Directive 9285.6-03. March 25.

EPA. 1996a. PCBs: Cancer Dose Assessment and Application to Environmental Mixtures. Office of Research and Development. EPA/600/P-

EPA. 1996b. Soil Screening Guidance: Technical Background Document, 2nd Ed. Office of Solid Waste and Emergency Response (OSWER). EPA/540/R95/128. May.

EPA. 2001. Risk Assessment Guidance for Superfund. Volume I, Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). Interim. Review Draft - For Public Comment. Office of Emergency and Remedial Response. EPA/540/R/99/005. OSWER Directive 9285.7-02EP. September.

400349